

What is claimed is:

- 1 1. A combination of phosphors formulated to coat the inside of a fluorescent
2 lamp to emit light having a spectral distribution to enhance effective pupil
3 lumens comprising effective amounts of two or more of the following:
4 strontium boride, yttrium oxide, barium yttrium, europium, terbium, barium
5 borate and calcium having a peak luminescence in the scotopic range.
- 1 2. The combination of phosphors of Claim 1 wherein the power distribution
2 includes a major peak and a minor peak separated by a trough.
- 1 3. The combination of phosphors of Claim 2 wherein the percentage of power at
2 the major peak is at least 5 times the percentage of power at the trough.
- 1 4. The combination of phosphors of Claim 3 wherein the percentage of power at
2 the major peak is at least 1.5 times greater than percentage of power at the
3 minor peak.
- 1 5. The combination of phosphors of Claim 2 wherein the percentage of power at
2 the major peak is at least 1.5 times greater than percentage of power at the
3 minor peak.
- 1 6. The combination of phosphors of Claim 1 wherein the dominant wave length
2 is from about 505 to about 515 nanometers.
- 1 7. The combination of phosphors of Claim 1 wherein the scotopic lumen to the
2 photopic lumen ratio is at least 2.25.

- 1 8. The combination of phosphors of Claim 7 wherein the effective pupil lumens is
2 at least $2.25^{0.78}$ times the photopic lumens measured in the lamp output.
- 1 9. The combination of phosphors of Claim 8 wherein the effective pupil lumens
2 per watt is at least about 40.
- 1 10. The combination of phosphors of Claim 7 wherein the effective pupil lumens
2 per watt is at least about 40.
- 1 11. The combination of phosphors of Claim 1 wherein the effective pupil lumens is
2 at least $2.25^{0.78}$ times the photopic lumens measured in the lamp output.
- 1 12. The combination of phosphors of Claim 11 wherein the effective pupil lumens
2 per watt is at least about 40.
- 1 13. The combination of phosphors of Claim 1 wherein the effective pupil lumens
2 per watt is at least about 40.
- 1 14. The combination of phosphors of Claim 1 wherein the scotopic lumen to the
2 photopic lumen ratio is about 2.25.
- 1 15. The combination of phosphors of Claim 14 wherein the effective pupil lumens
2 is $2.3^{0.78}$ times the photopic lumens measured in the lamp output 0.
- 1 16. The combination of phosphors of Claim 15 where the effective pupil lumens
2 per watt is about 45.

- 1 17. The combination of phosphors of Claim 14 wherein the effective pupil lumens
2 is $2.3^{0.78}$ times the photopic lumens measured in the lamp output.
- 1 18. The combination of phosphors of Claim 1 wherein the effective pupil lumens is
2 $2.3^{0.78}$ times the photopic lumens measured in the lamp output.
- 1 19. The combination of phosphors of Claim 18 wherein the effective pupil lumens
2 per watt is about 45.
- 1 20. The combination of phosphors of Claim 1 wherein the effective pupil lumens
2 per watt is about 45.
- 1 21. The combination of phosphors of Claim 1 wherein the percentages by weight
2 of the combination of phosphors are about 46 percent strontium boride, about
3 24 percent each of yttrium oxide and barium yttrium oxide, about 2 percent
4 each of europium and terbium, and about 1 percent each of barium borate
5 and calcium.
- 1 22. The combination of phosphors of Claim 1 wherein the percentages by weight
2 of the combination of phosphors are at least about 40 percent strontium
3 boride, at least about 20 percent each of yttrium oxide and barium yttrium
4 oxide, at least about 2 percent of europium and terbium, and at least about 1
5 percent of barium borate and calcium.
- 1 23. The combination of phosphors of Claim 2 wherein the major peak is between
2 about 540 and about 550 nanometers.

1 24. The combination of phosphors of Claim 23 wherein the minor peak is between
2 about 480 and about 500 nanometers.

1 25. The combination of phosphors of Claim 24 wherein the trough is between
2 about 560 and about 605 nanometers.

1 26. The combination of phosphors of Claim 2 wherein the minor peak is between
2 about 480 and about 500 nanometers.

1 27. The combination of phosphors of Claim 26 wherein the trough is between
2 about 560 and about 605 nanometers.

1 28. The combination of phosphors of Claim 2 wherein the trough is between
2 about 560 and about 605 nanometers.